

7-E
EELGRASS MONITORING
SURVEY PLAN FOR THE
BRIGHTWATER MARINE
OUTFALL ALTERNATIVES

FINAL
ENVIRONMENTAL
IMPACT STATEMENT

Brightwater
Regional Wastewater
Treatment System

APPENDICES

Final

Appendix 7-E

Eelgrass Monitoring Survey Plan for the Brightwater Marine Outfall Alternatives

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1.0. INTRODUCTION

1.1 The Brightwater Marine Outfall Siting Process

King County has prepared a Draft Environmental Impact Statement (Draft EIS) and Final Environmental Impact Statement (Final EIS) on the Brightwater Regional Wastewater Treatment System. The Final EIS is intended to provide decision-makers, regulatory agencies and the public with information regarding the probable significant adverse impacts of the Brightwater proposal and identify alternatives and reasonable mitigation measures.

King County Executive Ron Sims has identified a preferred alternative, which is outlined in the Final EIS. This preferred alternative is for public information only, and is not intended in any way to prejudge the County's final decision, which will be made following the issuance of the Final EIS with accompanying technical appendices, comments on the Draft EIS and responses from King County, and additional supporting information. After issuance of the Final EIS, the King County Executive will select final locations for a treatment plant, marine outfall and associated conveyances.

The County Executive authorized the preparation of a set of Technical Reports, in support of the Final EIS. These reports represent a substantial volume of additional investigation on the identified Brightwater alternatives, as appropriate, to identify probable significant adverse environmental impacts as required by the State Environmental Policy Act (SEPA). The collection of pertinent information and evaluation of impacts and mitigation measures on the Brightwater proposal is an ongoing process. The Final EIS incorporates this updated information and additional analysis of the probable significant adverse environmental impacts of the Brightwater alternatives, along with identification of reasonable mitigation measures. Additional evaluation will continue as part of meeting federal, state and local permitting requirements.

Thus, the readers of this Technical Report should take into account the preliminary nature of the data contained herein, as well as the fact that new information relating to Brightwater may become available as the permit process gets underway. It is released at this time as part of King County's commitment to share information with the public as it is being developed.

1.2 Survey Purpose

As part of the siting process for a proposed marine outfall for the Brightwater Treatment Plant, King County Department of Natural Resources and Parks documented the distribution and abundance of eelgrass and macroalgae along the Puget Sound shoreline from approximately Mukilteo south to the Shilshole Marina. The original survey was conducted with hydroacoustic and video equipment towed from a boat that included surveys in the two candidate outfall Zones 6 and 7S (Figure 1). A small area surrounding the Chevron barge dock at Point Wells in Zone 7S was not surveyed due to difficulties in maneuvering the boat and towed equipment near the dock structure. Since this area is in close proximity to the preferred proposed outfall alignment, it is important to document eelgrass habitat in the area. King County proposes to perform an eelgrass

survey to fill the data gaps from the previous survey and to provide information for incorporation into the Final Environmental Impact Statement regarding eelgrass abundance and distribution along the proposed outfall alignments in each of the two zones.

The survey will be conducted utilizing SCUBA divers to maneuver within the space inshore of the Chevron barge dock in candidate Zone 7S. Surveys will also be performed along the proposed outfall alignment in Zone 6 that was previously surveyed with video equipment at the southern portion of the zone and the proposed alignment at the southern end of Zone 7S that was previously surveyed with hydroacoustic and video equipment. The diver surveys will be performed at each site so that comparable data is collected from both zones utilizing the same survey technique.

Following selection of the final outfall alignment, a detailed eelgrass monitoring plan will be developed to assess temporal variability and establish baseline eelgrass conditions prior to outfall construction.

2.0. SITE DESCRIPTION

Zone 6 is located offshore of Edwards Point and extends approximately 7,500 feet west from the shoreline to water depths of almost 600 feet (see Figure 1). There is a marine sanctuary at the north end of the zone and a major structure (the former Union Oil pier) extending from the shoreline to approximately -50 feet (ft) mean lower low water (MLLW). The proposed outfall alignment in this zone extends north of the pier to approximately 600 ft in water depth. Eelgrass data collected during the previous survey and additional data collected by Pentec (Woodruff et al. 2001; Pentec 1995) indicate that eelgrass appears to be patchy in this zone.

Zone 7S is located offshore of Point Wells and extends approximately 7,500 ft west from the shoreline to water depths of almost 700 ft (see Figure 1). There are two proposed outfall alignments in this zone, the preferred being in the northern end of the zone. Eelgrass data collected during the previous survey (Woodruff et al. 2001) indicate that eelgrass coverage is moderate throughout most of the shoreline down to approximately -20 ft MLLW and there are a few patches of dense eelgrass in this zone.

3.0. SURVEY PLAN

Through communications with Washington State Department of Fish and Wildlife (WDFW), it has been determined that the survey areas are located within areas of documented eelgrass/macroalgae habitats; however the survey areas are not herring spawning areas. In areas where herring spawn has not been documented, WDFW guidelines call for an intermediate level dive survey, however, because eelgrass populations are possibly sparse and patchy in the proposed survey areas, an intensive survey will be conducted.

This dive survey plan conforms to WDFW guidelines for conducting intensive eelgrass/macroalgae surveys (Preliminary Eelgrass/Macroalgae Habitat Survey Guidelines, WDFW, 1999). Thirteen transects, perpendicular to shore, are planned for each survey area. Transects will be placed according to the following:

- along each proposed outfall alignment;
- within 10, 20, and 30 ft on both sides of each proposed outfall alignment;
- and then at 25 ft increments in both directions from the alignment out to a distance of 105 ft on either side of the proposed alignment (Figures 2 through 3).

The exception to this transect placement is along the Richmond Beach alignment in Zone 7S. Only the area along the proposed outfall alignment and then 20 ft on both sides of the alignment will be surveyed (Figure 4). This proposed alignment is being surveyed in order to obtain comparable data with the preferred alignment and to compare data previously collected by hydroacoustic and video equipment.

Divers will record information needed to document existing conditions along each transect at 20 ft intervals. Information to be recorded on underwater slates at each survey position will include:

Visual and qualitative substrate characterization along each transect

Eelgrass turion (shoot) counts per 0.25m^2 at the 2, 6, and 10 o'clock positions at each survey position along each transect

Percent cover of macroalgae per 0.25m^2 at the 2, 6, and 10 o'clock positions at each survey position along each transect

Time, depth, and relative visibility will be recorded at each survey position along each transect

Presence of easily observed invertebrate/vertebrate species

In addition, divers will note the inner and outer boundary locations of eelgrass encountered along each transect.

3.1 Transect Positioning

Transects will be surveyed perpendicular from the shoreline. Each transect will be initiated from the ordinary high water line and survey data will be collected at 20 ft intervals along each transect. Each transect will extend seaward to the edge of the project area (approximately the -60 ft MLLW contour or to the outer extent of the eelgrass-macroalgae habitat). Transects will be set along the beach and will include one transect

along the proposed alignment, at 10, 20, and 30 ft. intervals, and then out 25 ft. intervals to 105 ft. on both sides of the proposed alignment.

Transects will be a line marked at 20 ft. increments. The starting position for each transect will be recorded using Differential Global Position System (DGPS, resolution +/- 2 feet) instrumentation. Transects comprised of a marked line will be placed from the surface using a support vessel. An azimuth determined using the DGPS will be used to place the transect from shore. The shoreward end of each transect will be attached to shore and the line extended following predetermine compass headings. The offshore end of each transect will be marked with a buoy to aid in the placement of adjacent transects. The compass bearing of each transect from the starting point will be noted on the field data sheet. Transect positioning will be referenced to one or two permanent land features within the project area at the time of the survey. Both ends of each transect will be recorded using DGPS to allow the transects to be repeated at a future date.

3.2 Data Collection

As divers proceed along each transect, they will note the locations of the boundaries of eelgrass beds (or patches). Divers will stop at each 20 ft. increment to record data in both the intertidal and subtidal habitats. The substrate characteristics at each survey stop will be evaluated by the diver. Substrate characteristics (such as percent of sand, gravel etc.) will be noted on the data form. Eelgrass and macroalgae densities will be counted using a 0.25m² PVC quadrat. The quadrat will be placed in three positions at each survey stop along each transect. The quadrat will be rotated on one corner to collect separate density counts at the 2, 6, and 10 o'clock positions. Depth will be determined at each survey stop using the divers depth gauge and qualitative observations of visibility will be noted on the divers slate. Time at the start and end of each transect will be noted for depth adjustments with the tide levels. Tidal corrections will be made using Tides and Currents® available from Nautical Software, Inc. A sample field data sheet is attached to this plan.

3.3 Schedule

WDFW guidelines for an eelgrass survey require that surveys be conducted between June 1 and October 1. Assuming there is no difficulty gaining access to the site, the project survey will be conducted during the summer of 2003 when King County gives notice to proceed.

An interim report will be generated seven business days after returning from the field. The interim report will contain copies of the datasheets and a brief synopsis of the abundance and distribution of eelgrass in the project area. A final draft report will be completed two weeks after the interim report.

3.4 Reporting

WDFW reporting requirements include a site map indicating the distribution of eelgrass/macroalgae species, substrate characterization, approximate depth contours referenced to MLLW, and the approximate location of the proposed outfall alignment. Survey documentation will include the time and date of the survey, turbidity/visibility, presence of invertebrate/vertebrate species and general habitat observations pertinent to habitat characterizations within the project site. Copies of dive survey data forms and reference position coordinates will be included in the survey report. Data will be provided electronically for incorporation into GIS maps.

Results of the preliminary survey will be compiled and sent to the WDFW habitat manager and the Department of Natural Resources for review.

4.0. SAFETY PLAN

4.1 Dive Team

The dive team will consist of David Gillingham and Bill Peters from Parametrix. Both are insured for scientific diving as described in Washington Department of Labor and Industries WAC 296-37-590 and have eelgrass survey and underwater delineation experience.

4.1.1 Diving Assignments

Divers will work underwater as a team with one designated navigator and one recorder. Divers will be in direct visual contact with each other.

4.1.2 Equipment

Standard SCUBA equipment (i.e. dry suits or wet suits) will be used. Dives will be conducted from a Parametrix vessel.

4.1.3 Safety Considerations

Potential safety concerns associated with conducting the underwater biological surveys are overhead boat traffic, entanglement and separation of the dive buddy team. The procedures for minimizing diver risk because of these concerns are identified below.

4.1.3.1 Overhead Boat Traffic

Prior to entering the water, divers will notify any vessels in the immediate area that dive operations will take place. Divers will tow a surface dive flag during each dive. In addition, a dive flag will be displayed on the dive vessel. The dive tender will maintain visual contact with the divers locations and will divert any approaching pleasure craft that appear to be entering the vicinity of the dive sites (bullhorn or radio).

4.1.3.2 Entanglement

The risk of entanglement is primarily from debris and discarded fishing gear. Each diver will carry a sharp knife. Dive buddies will stay in visual contact and be prepared to provide immediate assistance if a diver becomes entangled.

4.1.3.3 Separation of Dive Buddies

The risk of dive buddies becoming separated while performing underwater surveys is relatively low because the divers will be in direct contact with each other. If dive buddies do become separated, they will surface and regroup.

4.1.3.4 Emergency Assistance

First aid supplies and dive tables will be available on the dive vessel. A cell phone will be available on the dive vessel for emergency calls to 911. The nearest hyperbaric chamber is Virginia Mason Hospital **(206) 624-1114**, extension 245. The nearest Coast Guard Rescue Coordination Center is in Seattle at **(206) 217-6000**. The closest hospital, Stevens Hospital, is in Edmonds at 21601 76th Avenue West, Edmonds, Washington 98026. The phone number at the hospital is **(425) 640-4014**. A map showing the location of Stevens Hospital is attached to this plan. The best transportation to emergency aid would be either by vehicle or helicopter (depending on the severity and nature of the injury).

4.2 DIVE AND SAFETY PLAN REVIEW

The undersigned approve this dive and safety plan and agree that the diving operations as outlined in this plan comply with Parametrix and Contractor safety procedures.

Parametrix

Date

Contractor

Date

Eelgrass Survey Data Log

Date: _____ Transect # _____ Time: _____ Tide: _____
 Compass: _____ Start: _____ End: _____

	Transect Stops						
	20	40	60	80	100	120	140
Depth							
Depth @ MLLW							
Visibility							
Substrate							
Boulder (%)							
Cobble (%)							
Gravel (%)							
Sand (%)							
Mud(%)							
Eelgrass/0.25 m2							
2 o'clock							
6 o'clock							
10 o'clock							
Macroalgae Percent Cover/0.25 m2							
2 o'clock							
6 o'clock							
10 o'clock							
Dominant Algal							
Species:							
Invertebrates							
Geoduck							
Dungeness crab							
Starfish							
Fish							
Other							

5.0. REFERENCES

- Pentec Env. Inc. 1995. Marine Resources in the Vicinity of Potential Washington Ferry Terminal Sited in Edmonds. Submitted to CH2M Hill by Pentec Env. Inc., Edmonds, Washington.
- WDFW. 1999. Eelgrass/Macroalgae Habitat Survey Guidelines. Habitat and Land Services. Olympia Washington.
- Woodruff, D.L., P.J. Farley, A.B. Borde, J.S. Southard, and R.M. Thom. 2001. King County Nearshore Habitat Mapping Data Report: picnic Point to Shilshole Marina. Prepared for King County DNR by Battelle Marine Sciences Laboratory, Sequim, Washington.

Figures

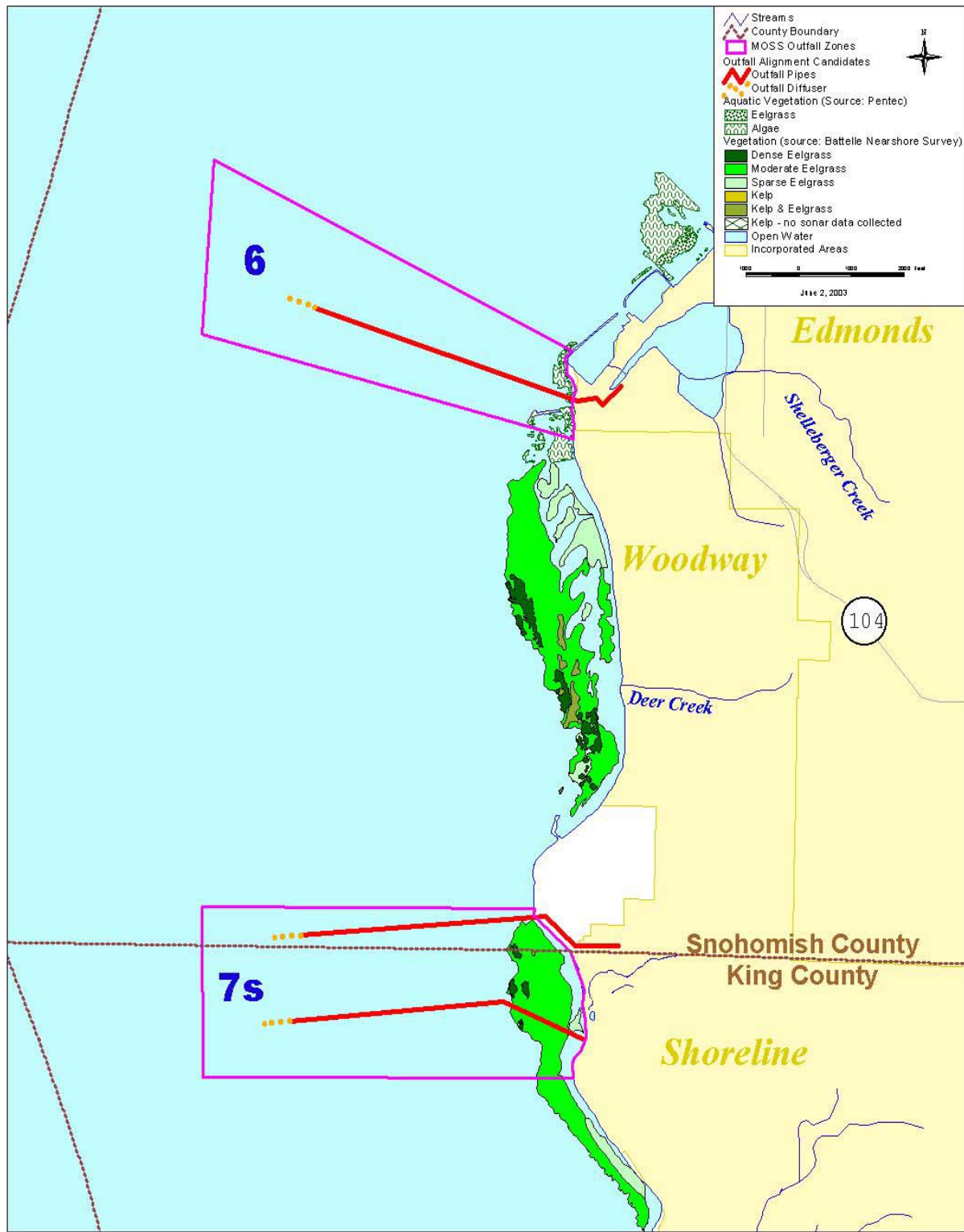


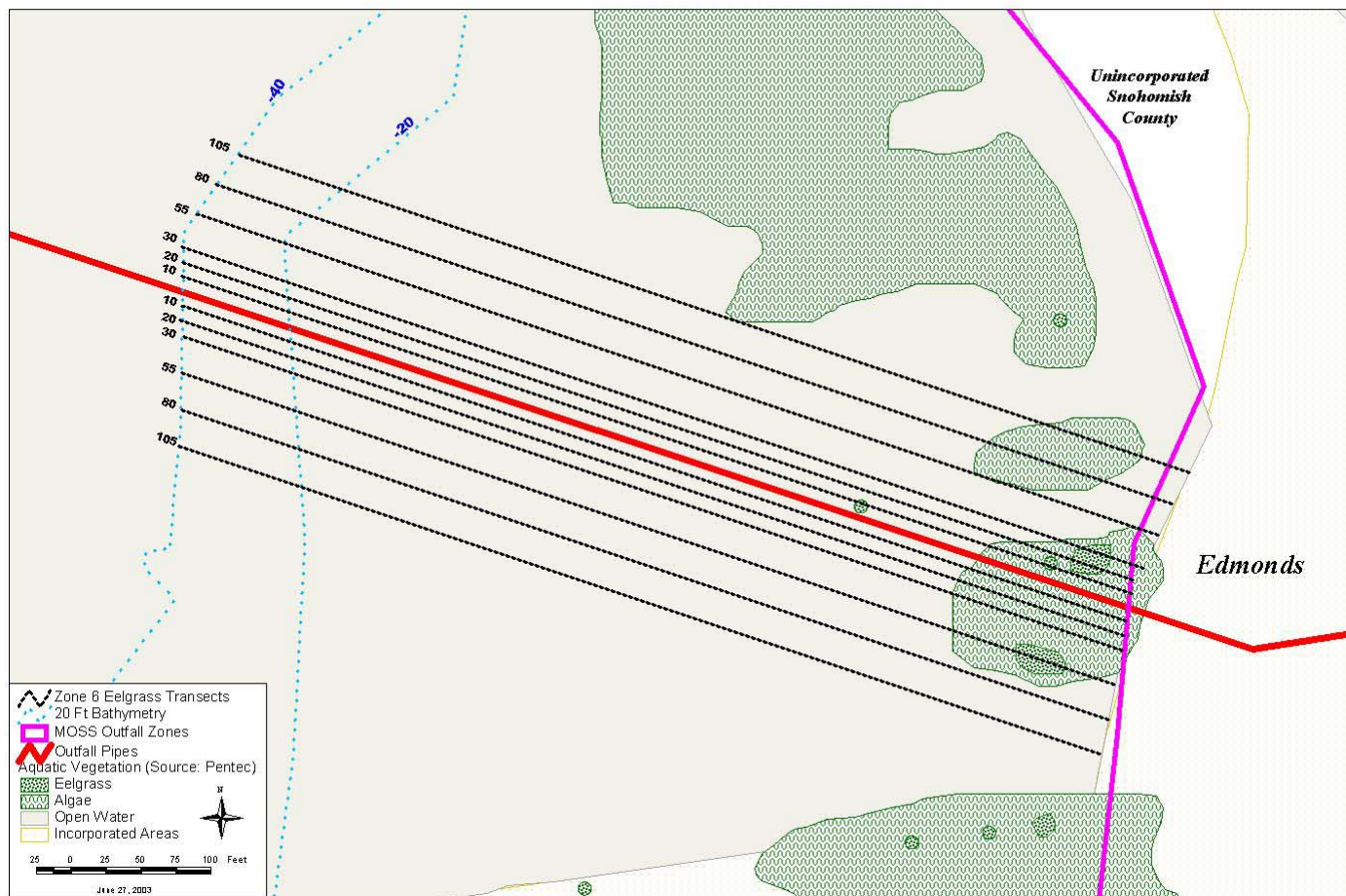
Figure 1

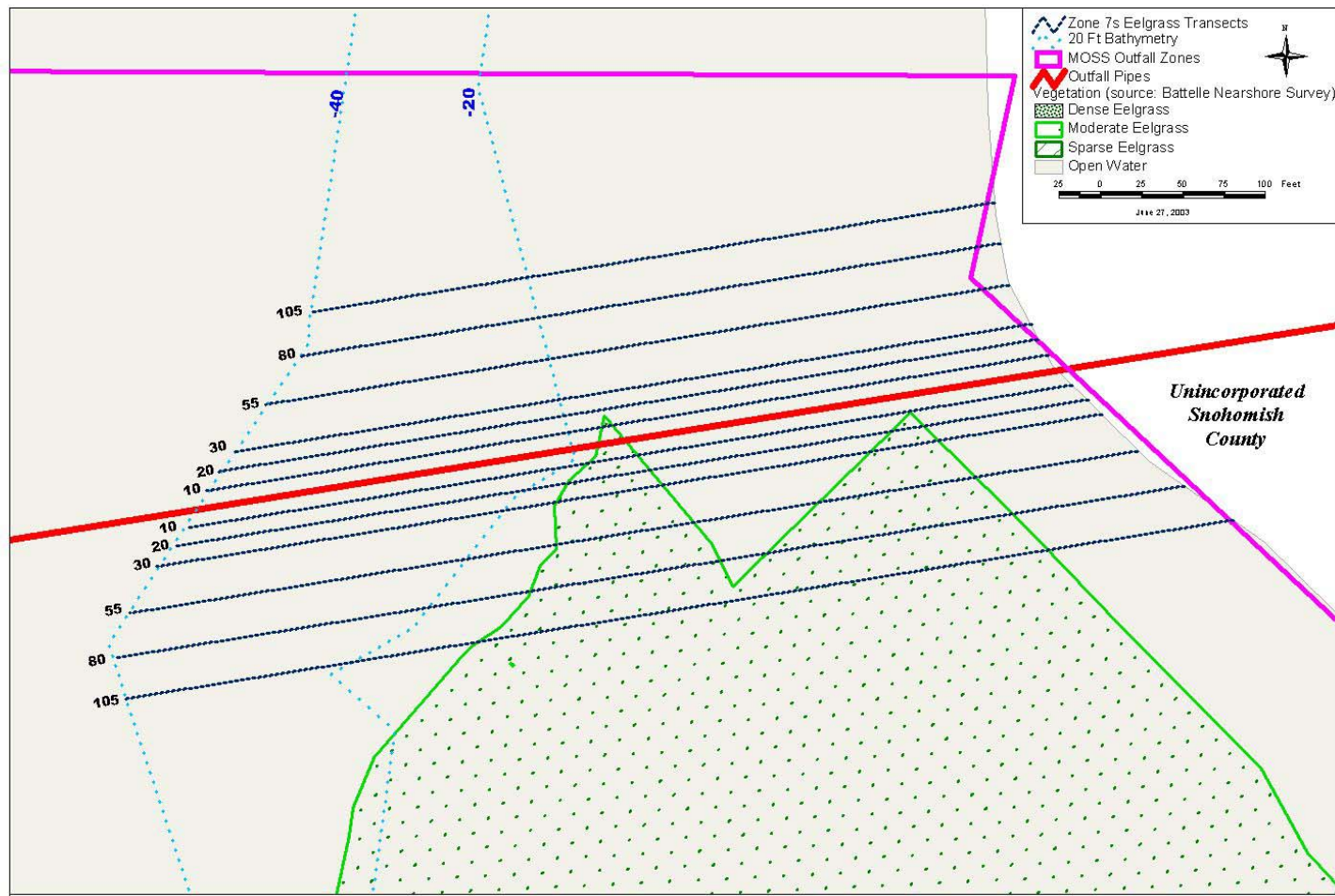


King County
Department of Natural Resources and Parks
Wastewater Treatment Division

File Name: TM09XF0X
Prepared by: Bruce Naim

Outfall Siting Area
BRIGHTWATER REGIONAL
WASTEWATER TREATMENT SYSTEM





King County
Department of Natural Resources and Parks
Wastewater Treatment Division

File Name: TM09XF0X
Prepared by: Bruce Nairn

Figure 3

Eelgrass Survey Transects Zone 7S, Pipe 3

**BRIGHTWATER REGIONAL
WASTEWATER TREATMENT SYSTEM**

